Signalized Intersection Spacing

One of the variables involved in the planning, design and operation of signalized arterial streets is "Signalized Intersection Spacing" (See Table 2-2). Efficient traffic progression is essential on arterials in order to maximize safety and capacity. Moreover, at high progression efficiencies, fewer vehicles are required to come to a stop. Deceleration noise is reduced: thus, vehicle emissions, fuel consumption and delay are minimized. Since capacity will always be an issue on an urban arterial once urban development has occurred, the signal spacing must be such that very high progression efficiencies can be obtained over a wide range of through and turn volumes which change over time and which differ by time of day.

Selecting long and uniform signalized intersection spacing is an essential element in establishing spacing standards. Several studies have found that the number of crashes and crash rates increases with the frequency of traffic signals. For example an increase in signal density from 2.0 or less to 2.1 to 4.0 signals per mile can result in a 70% increase in the average crash rate – from about 2.8 to 4.8 crashes per million vehicle miles. The increased number of signals per mile also results in poor fuel efficiency and excessive vehicle emissions.

(Source: TRB *Access Management Manual*. 2003)

Signalized Intersection Spacing
• Essential to Movement Function • Parameters - Speed - Cycle Length ("Green" Band desired) - Signal Spacing - Efficiency of Progression - Vehicle Mix - Grade - Queuing - Emergency Preemptions

Source: NHI Course No. 15255, additions made by Committee.

Arterials are intended to provide a high degree of mobility and serve the longer trips. Since movement, not access, is the principal function, access management is essential in order to preserve capacity and safety. [AASHTO's "*A Policy on the Geometric Design of Highways and Streets*" (Green Book)]. Further, the adoption of functional design, in lieu of volume based design, represents a major change in the philosophy of planning and design of street and highway systems.

A uniform signal spacing of ½ mile provides for efficient signal progression at speeds of 30 mph to 60 mph along arterials. At these speeds maximum flow rates are achieved and fuel consumption and emissions are kept to a minimum.